Amendments to Specification

Please amend paragraph [26] on page 6 to read as follows:

Referring back to conventional needle valve member 13 which also has an open and closed position similar to HCCI needle valve member 12. Conventional needle valve member 13 has a closing hydraulic surface 38 that is exposed to a fluid pressure in the conventional needle control chamber 32, which is fluidly connected to control pressure line 33. Conventional needle valve member 13 also contains an opening hydraulic surface 37, which is exposed to the fluid pressure in nozzle supply passage 34. Conventional biasing spring 31 is used to bias the conventional needle valve member toward its closed position (as shown in figures 1a-b), therefore blocking conventional nozzle outlets 17. When the fuel pressure force acting on opening hydraulic surface 37 exceeds the fluid pressure acting on closing hydraulic surface 38, the biasing force exerted by conventional biasing spring 31, the fluid pressure acting on closing hydraulic surface 28 and the biasing force exerted by HCCI biasing spring 21 (i.e. conventional valve opening pressure), conventional needle valve member is raised toward its open position. Once the conventional valve surface 42 is not in connection with conventional valve seat 43, nozzle supply passage 34 is fluidly connected to conventional nozzle outlet 17 and fuel can be injected. In addition to the conventional needle valve ~~nozzle~~ member 13 moving upward, the HCCI needle valve member 12 is raised as a result of the conventional valve opening pressure acting on conventional needle valve member 13.

Please amend paragraph [27] that begins on page 6 and ends on page 7 to read as follows:

Note that when HCCI needle valve member 12 is raised during conventional fuel injection, HCCI valve surface and HCCI valve seat remain in contact at all times. This is due to two factors. First, the valve opening pressure for conventional needle valve member 13 is less than the valve opening pressure for HCCI needle valve member 12. In other words, when low pressure is acting on both HCCI closing hydraulic surface 28 and conventional closing hydraulic surface 38, the conventional needle valve opening pressure will be reached prior to the HCCI valve opening pressure being reached. It should be appreciated that because conventional needle valve member ~~12~~ 13 must overcome the forces of HCCI biasing spring 21 and conventional biasing spring 31, opening hydraulic surface 37 should be sized appropriately with respect to opening hydraulic surface 27 to allow for a lower conventional valve opening pressure than the HCCI valve opening pressure. Therefore, conventional needle valve member 13 will be moving toward its opening position before HCCI needle valve member 12 can move toward its opening position. Secondly, HCCI stop pin 22 limits the movement of HCCI needle valve member 12 such that the HCCI needle valve member is prevented from separating the HCCI valve surface 40 from HCCI valve seat 41.

B2

Please amend paragraph [30] on page 8 to read as follows:

Preferably nozzle insert 14 contains an abutment surface 55 that is adjacent and perpendicular to the second cylindrical surface 52. Abutment surface 55 is the connection plane for tube 15. It can be appreciated that the second cylindrical surface 52, which could be considered a male mating surface, of nozzle insert 14 has only a slightly different diameter than the inner surface 19, which could be considered a cylindrical female mating surface of tube 15. These dimensions are such that the tube 15 and nozzle insert 14 can be pressed fit and welded together to form a single metallic

B3

piece. Any irregularities in the cylindrical nature of these pieces might cause friction or unwanted pressure points that could cause fuel injection failure. The press fitting and welding will create a single metallic piece that is irreversibly attached to avoid the possibility of needle breakage. One skilled in the art can appreciate that the conventional needle valve member 13 and the HCCI needle portion 25 should be closely concentric about a centerline through needle valve 11. This alignment is needed to avoid sided forces when HCCI valve surface 40 contacts HCCI valve seat 41.

B3

Please amend paragraph [35] on page 10 to read as follows:

Now referring in particular to Figure 5b-c, plug insert 370 contains a slot 372 that is grounded into the top of the plug insert 370 and extends down into plug insert 370 for a specified distance. The plug insert 370 preferably also contains two bores 374 that are bored into it from the bottom end. ~~Grooves~~ Bores 374 will create two outlets at the end of the plug which will define the HCCI nozzle outlet 316. In other words, the fuel will pass downward through the passage opening of nozzle insert 314, into the slot 372, proceed to the annulus 371, and finally into bores 374 before the fuel exits the plug insert 314. It can be appreciated that the fuel stream will create an impinging intersection point that is located outside the plug insert. Furthermore, it can appreciated that the dimensions of slot 372, annulus 371 and ~~grooves~~ bores 374 will vary depending the type of fuel spray desired.

B4